STRATEGY RESEARCH PROJECT

DEVELOPMENT OF INFORMATION MANAGERS IN THE ACTIVE GUARD/RESERVE

BY

LIEUTENANT COLONEL JAMES R. HILL, III

SENIOR SERVICE COLLEGE FELLOW, U.S. ARMY
THE UNIVERSITY OF TEXAS AT AUSTIN

USAWC CLASS OF 1999

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

19990818 208

Senior Service College Fellowship Research Project

DEVELOPMENT of
INFORMATION MANAGERS
in the ACTIVE GUARD/RESERVE

by

LTC James R. Hill, III

Jerry G. Davis, Ph.D.
Project Advisor

Senior Service College Fellowship
University of Texas at Austin

ABSTRACT

Automated systems are the veins and arteries that carry the life blood of every function in the organization - information. They tie all of our functions together. They let us view our past and plan our future. Electronic collection, storage, retrieval, and transmission of information is now a critical part of our lives.

The Army is spending over $2 billion (with a "B") on a single project to support the Reserve Components. Information management represents a significant business investment. The US Army Reserve is ill prepared to manage that magnitude of effort in the future.

We stand on the leading edge of a new era of warfare and technology. We can either pay the price to be prepared or pay the price for recovery and catch-up. Being prepared means ensuring our Information Managers are trained and capable. To accomplish that goal will take adjusting our structure, the rotation of our managers, and our training courses, as well as our basic philosophy. ·There must also be an involved central Information Management godfather: watching assignments - ensuring wide functional exposure; watching training - ensuring up to date, relevant material; watching people - growing the senior managers for the future.

The author is a Fellow at the US Army War College program at the University of Texas - Austin. With a bachelor's and a master's degree in Computer Science, LTC Hill entered the AGR program in 1987. Providing automation support to the Personnel and Force Development communities, he has had tours at ISC-ARPERCEN, OCAR, and the USARC.

i

CONTENTS

1. INTRODUCTION

Computers are no longer simply a convenient way of storing statistics from our history. Automated systems are the veins and arteries that carry the life blood of every function in the organization - information. They carry our thoughts, our lessons, our orders, our questions to any point in the world. They tie all of our functions together. They let us view our past and plan our future. If you question how much automation is entrenched in our work, watch a headquarters when the Local Area Network (LAN) is down. Life pretty much stops. Electronic collection, storage, retrieval, and transmission of information is now a critical part of our lives.

By November 1996, the U.S. Army spent $1,060,000,000 on just one systems development project[1]. That development was projected to need another $950,000,000 for fiscal years through 2003[2]. That is over $2 billion (with a "B"). Information management represents a significant business investment. Significant enough that congress mandated that every agency establish an executive level position whose sole purpose is to oversee Information Management activity - the Chief Information Officer (CIO).

The "INFORMATION TECHNOLOGY MANAGEMENT REFORM ACT" (ITMRA), referred to as the Clinger/Cohen Act, defines the requirement of training the information resource management infrastructure inside an agency.

40 USC 1425. SEC. 5125. AGENCY CHIEF INFORMATION OFFICER

(c) DUTIES AND QUALIFICATIONS- The Chief Information Officer of
an agency that is listed in section 901(b) of title 31, United
States Code, shall—

>   (3) annually, as part of the strategic planning and
>   performance evaluation process required (subject to section
>   1117 of title 31, United States Code) under section 306 of
>   title 5, United States Code, and sections 1105(a)(29), 1115,
>   1116, 1117, and 9703 of title 31, United States Code—

---

[1] *Report Number 97-019: Evaluation of the Reserve Component Automation System*, Office of the Inspector General, Department of Defense, 1 November 1996.
[2] *Reserve Component Automation System: Acquisition Program Baseline Agreement*, RCAS Project Office, 23 July 1996.

(A) assess the requirements established for agency personnel regarding knowledge and skill in information resources management and the adequacy of such requirements for facilitating the achievement of the performance goals established for information resources management;

(B) assess the extent to which the positions and personnel at the executive level of the agency and the positions and personnel at management level of the agency below the executive level meet those requirements;

(C) in order to rectify any deficiency in meeting those requirements, develop strategies and specific plans for hiring, training, and professional development;...

Accomplishing this task, using traditional techniques, is difficult within the Full Time Support (FTS) structure of the US Army Reserve. The FTS mission is to fund, equip, train, and prepare the larger citizen soldier force for deployment and integration into an engaged Total Army force. By definition, the FTS is a relatively small number of soldiers and civilians dispersed across the entire United States and overseas.

The purpose of this paper is to explore ways of better preparing the FTS Information Managers to support the FTS mission. That will require an in-depth knowledge of automation and the technology they use, as well as an understanding of the organizational and bureaucratic structure in which they work.

2. CURRENT STRUCTURE AND MISSIONS OF USAR FTS INFORMATION MANAGERS

The FTS staff in the US Army Reserves (USAR) is a balance of civilian and military positions. This balance was devised to leverage the strengths of each category for the good of the units. The military component, traditionally, rotates on a regular basis. They, therefore, bring an understanding of techniques and tools being used other places. They have an understanding of the requirements of other levels of the organization. They are fresh blood and new ideas. The rotation of the military contributes to homogenous operation across commands. Because they rotate routinely, there are also opportunities to provide training between stations with less disruption to the organization. The civilians, who move less frequently, add

consistency and historic context. The civilian work force applies specific job expertise reflective of the unique requirements of the unit and locale. They maintain stable operations as the military rotate.

The current structure of military information management positions in the US Army Reserve FTS is not conducive to the growth of personnel. Of the eighty-five required positions, two are Colonels, nineteen are Lieutenant Colonels, fifty are Majors, and only twelve are Captains. This structure necessitates recruiting Majors or senior Captains, just to release them from active duty because the system is unable to promote them.

The limited growth patterns in FTS information management are further complicated by the ever increasing delineation of skills required in different positions. For discussion, the positions are divided into four categories: administrative support; technical infrastructure; resource management; and information operations.

Administrative support encompasses copier support, records management, Freedom of Information Act (FOIA) functions, printing and publications, and mail services. These functions are generally less automation oriented, but remain a managerial responsibility. In some cases, depending on size of staff, they can be hands-on additional duties of assigned automators.

Technical infrastructure are the underlying functions required to implement communications and automation strategies (OPMS XXI Functional Area [FA] 24 - Information Systems Engineering). Telecommunications; local and wide area network planning, installation, and administration; customer support (help desks); computer operations; and baseline software installation are examples of technical infrastructure. Supervision of contract support also requires technical expertise.

Resource management are those functions required for long-term success of the organization (OPMS XXI FA 53 - Information Systems Management). Strategic planning, architecture development, financial management and planning, policy development and enforcement, acquisition, and contract management fall in this

area. Systems design and development are in this area also. Full life cycle development utilizes many of the skills incumbent here. Further, most of our systems development is done under contract and, therefore, is an issue of analysis and management, not technical coding.

Information Operations is new as a documented position specialty (OPMS XXI FA 30 - Information Operations Officer). These positions will require an understanding of cyber (information) warfare. They will work network intrusion, counter-intrusion, virus detection and response, network and security plans and policy, and information in support of combat operations. The last function includes techniques to assimilate information relevant to the warfight (ie., intelligence, friendly location and status, and plans). It also deals with filtering an enormous amount of data into usable information. Today, Information Operations represent thirteen FTS officer positions. Given the proposed structure, the mission area would primarily fall to the drilling reservists and the FTS would be the management team. Booz, Allen, and Hamilton (BAH), under contract to the Land Information Warfare Agency (LIWA), has developed a series of courses in Information Operations. The Army Reserve Readiness Training Center (ARRTC), FT McCoy has teamed with BAH to provide those courses via distance learning when classification and circumstances allow. Basic skill training for this mission is covered under the LIWA/BAH training plan and the management functions align with those above, therefore, this paper will not spend much time on this mission.

A further consideration in the professional development of personnel is the positions in each of these functional areas are not evenly spread across the grade or organizational structure. Although there is overlap and exceptions, the technical infrastructure positions are generally lower graded and located below headquarters level. The resource management functions are more prevalent at the three USAR headquarters (Army Reserve PERSonnel COMmand [ARPERSCOM], US Army Reserve Command [USARC], and the Office of the Chief,

Army Reserve [OCAR]). This fact necessitates a shift of skills as personnel progress through their careers, hence mandatory retraining.

3. **DEVELOPMENT OF MILITARY INFORMATION MANAGERS**

  a. **TRAINING AND SCHOOLS**

    1) Systems Automation Course (SAC)

To prepare our personnel, there are a number of Army/Department of Defense (DoD) courses. At the entry level is the SAC, given by the US Army Computer Science School (CSS), FT Gordon, GA. This course is available for military ranks 2nd Lieutenant through Lieutenant Colonel and civilian levels GS-9 and above who are assigned to or on orders for automation positions. The staff at FT Gordon did say that civilian participation was relatively uncommon. SAC provides a fundamental technical overview of military automation.

SAC is divided into three modules: Automation Fundamentals; Software Engineering; and Networking[3].

TITLE: AUTOMATION FUNDAMENTALS   119 hours
PURPOSE: To introduce the student to the Computer Science School and the Systems Automation Course, to determine the student's general knowledge level and basic skills, and to provide instruction and training in the subject areas of hardware, operating systems, information resource management, simulations, and information systems security.

TITLE: SOFTWARE ENGINEERING   336 hours
PURPOSE: To provide instruction and training in the subject areas of IDEF (system and data modeling), database (using MS Access), programming (using Visual Basic), software engineering, and Web.

TITLE: NETWORKING   304 hours
PURPOSE: To provide instruction and training in the subject areas of networking essentials, NT core technology, Internet working with TCP/IP, routers, Solaris systems administration, IP network management, network systems security, and MS Exchange/Defense Messaging System.

The technical overview provided by the Systems Automation Course (SAC) is extremely useful for personnel assigned to positions supporting the technical infrastructure. It has a view of many of the Resource Management functions, however, the training is limited to Active Component functions and becomes aged and generally forgotten prior to an assignment that utilizes it.

---

[3] See Annex B for complete course description.

2) Chief Information Officers (CIO) Certificate Program[4]

The next DoD course offered for Information Managers is the Chief Information Officers (CIO) certificate program. This course was mandated by the "INFORMATION TECHNOLOGY MANAGEMENT REFORM ACT" (ITMRA), (Clinger /Cohen Act).

The CIO Certificate Program, sponsored by the DoD CIO, provides a source of graduate education for all federal CIOs to use in developing agency personnel. It is responsive to the requirements set forth in the Clinger-Cohen Act of 1996 and establishes an official certificate that serves as recognition that an individual has received education in the Federal CIO competencies.

CERTIFICATE REQUIREMENTS[5]

Award of the certificate requires completion of eight 5-day intensive courses OR the Advanced Management Program (AMP) supplemented by a lessor number of intensive courses OR a combination of eight intensive and elective courses [Industrial College of the Armed Forces (ICAF) and National War College (NWC) students only]. Primary courses in six subject areas must be completed. Two of the primary areas must be Policy and Performance and Results-Based Management. The remaining two courses can be selected from either the primary or enrichment offerings for any subject area. Refer to the CIO Course listing for specific offerings.

Graduates of the AMP, a 14-week educational program which provides an integrated perspective of information management, receive credit for the following primary areas: Policy, Information Resources Strategic Planning, Process Improvement, and Acquisition. Additional credits may be earned for electives and the specialty track. The number of intensive courses required to complete the CIO certificate following AMP graduation depends on which electives and specialty track the student completed during the AMP.

ICAF and NWC students may complete part of the eight course requirement during their academic year by enrolling in selected electives. Remaining requirements may then be met by completing the necessary one-week intensive courses.[6]

Regardless of approach the participant takes to complete the certificate, participants should confer with their supervisors to determine which subject areas and courses are most critical for their positions and organizations.

From time to time, the IRM College may replace/add/delete courses and/or subject areas. In cases where courses and/or subject areas are dropped, students will receive credit for courses they have already taken while in the program.

---

[4] For further information on the IRMC CIO Certification Course, contact the Information Resource Management College, 300 5th Avenue Marshall Hall (Building 62) Fort Lesley J. McNair, DC 20319, (202) 685-2096, or visit their web site at http://www.ndu.edu/irmc/
[5] http://www.ndu.edu/irmc/ Academic Programs / DoD-CIO
[6] Annex C - CIO KEY COMPETENCIES covers subject areas and courses

Participants will have up to four years from the date of acceptance to complete the program.

METHODOLOGY

The primary teaching methodology is the seminar format supplemented by guest speakers. Completion of student assessments is mandatory and may take various forms, from individual papers and projects to team projects and presentations. In some cases, requirements are completed after the formal instruction. In these cases, students have up to three weeks to complete the assignment.

The IRM College conducts all classes on the Ft. McNair campus. As deemed appropriate, some courses may be taught at remote sites or using distance learning format.

PROGRAM ELIGIBILITY

The program is open to federal civilians in the grades of GS/GM 13-15 and military officers in the grades of O5-O6. A bachelor's degree is required. At this time, applications are not accepted from industry or international students. Waivers may be requested for applicants who are no more than one grade lower than minimum requirements. Waivers may also be requested for the degree requirement.

3) Information Manager Course (IMC) ATRRS Number: 921-610[7]

The target audience for this course is the Information Management Full Time Support personnel at the Regional Support Command / Direct Reporting Command level or key United States Army Reservist Management Operations Information Management staff (Troop Program Unit personnel) at each command. Students must be at Sergeant First Class / GS-09 or above.

This 2 week course provides students with premobilization, United States Army Reserve-unique skills and knowledge required to perform United States Army Reserve Information Management (IM) duties. This course covers such pertinent topics as life-cycle management planning, budgeting, automation systems, telecommunications, records management, publications and printing.[8]

4) Uncoordinated Local Training

The vast majority of training for Information Managers remains local training. This is true because the lack of centrally provided, centrally directed training leaves the manager with little choice if they wish to improve themselves or their staff. Unfortunately, this training varies

---

[7] http://fp1.centuryinter.net/arrtc/arrtc/imc.htm
[8] For further information on the ARRTC Information Manager Course (IMC). contact the Resource Information Management Training Center Chief. Ms. Zillmer at 1-800-982-3585 Ext. 7166. 608-388-7166 or DSN 280-7166.

greatly in content and quality. Personnel are trained strictly for the positions they hold and have to be retrained when they transfer.

b. ROTATION AND ASSIGNMENTS

The movement of personnel can be a hindrance to maintaining a properly trained work force or it may be an extremely useful tool, depending on the planning and structure put in place. Currently, as I mentioned earlier, the military remains relatively mobile. Unfortunately, the assignment system is still subject to political pressure and by-name requests. There is not an Information Management center of power that has taken ownership of development and assignment of junior officers. Local powers tend to push the system to retain talented officers that are or have been previously assigned in specific functional areas or locations. This, however, limits an officer's exposure to the rest of the system and its requirements. Once a force development automator or personnel automator, always one.

The civilian work force is much less mobile. Although this adds stability and historical context, it limits exposure to the rest of the system. An in-depth understanding of requirements at other levels of the organization is either missing or learned through the person's own initiative. The smaller mobility rate also makes it difficult to arrange technical enhancement/ refreshment that does not interfere with existing responsibilities.

c. CURRENT OBSERVATIONS OF INFORMATION MANAGERS

In an effort to capture the current situation across the entire program, I interviewed personnel at major subordinate commands, each of the three USAR headquarters organizations, installation personnel, the Army's Computer Science School, and the DoD Information Resource Management College[9]. Although each had unique requirements and observations, there were several consistent themes in all locations.

---

[9] See Appendix for complete list of interviewed personnel.

1) Staffing shortages limits flexibility

Of eighty-three required FTS positions designated for fill by military automators, ten are not authorized and six are vacant[10]. With nearly one out of five required positions already unencumbered, there is incredible pressure not to leave those positions vacant while we train the assigned officers. The current situation rarely allows overlap between old and new staff. This, in turn, increases the time required to teach new personnel the job. In the civilian sector, most positions are one deep. If the incumbent goes to extended training, there is no one to do the work.

2) Limited funds for training or development

The drastic reduction in funding for training and travel has limited supervisors' willingness to expend money on professional development that is not dictated or directly applicable to the positions the personnel are currently assigned.

3) No systemic training

With few exceptions, each FTS automator learned his/her current job through osmosis or On-the-Job (OJT) training. The majority of the military automators had been to the SAC at FT Gordon. The civilian personnel had no systemic training. Some had applicable college course work, but that was infrequent.

4) No mentoring or career development

No one interviewed believed there was anyone managing this career field. There is not a senior member tracking and planning the development of the younger officers or civilian automators. There is no career map. In the active Army, there is a clear understanding of the traditional "ticket punch" positions: platoon leader; battery commander; squadron S-3 or XO; battalion command. The USAR FTS community has only recently been acknowledged as a

---

[9] See Appendix for complete list of interviewed personnel.

career program. This change requires a long-term view to development of personnel. The perception, if not the fact, is assignments are made based on short term factors. These factors are centered on by-name requests by headquarters and then the remaining slots are filled by whatever personnel are now in the window. This perception is partially based on the fact that the Personnel Management Officers are junior to most of the automators and are not even automators, in some cases.

5) No strategic plan

The system is generally seen as reactive rather than proactive, held captive by the funding process. When the direction of the information management program was known, there were limited details on intermediate objectives. This was not only true of system architecture plans, but also organizational structure changes and personnel issues.

6) Little communications up and down the chain

There is a general lack of systemic communications among the automation professionals across the program. Comments from lower levels of the organization suggested that their satisfaction would increase if they better understood the current fiscal situation and the fiscal process, available training / job opportunities, and long range plans and modifications to those plans.

4. RECOMMENDATIONS

a. ENSURING CONTINUITY

Continuity across an organization is dependent on communications. Many of the observations cited in this project, coming from the lower levels of command, stem from a feeling of being disconnected from the "front office". In today's environment, continuous dialogue is merely a mind-set. Communications between anyone in the organization is an e-mail message or a

---

[10] Position and fill information from The Army Authorization Documentation System - Revised and from the Office of the Chief Information Officer, Office, Chief Army Reserve.

web site posting away. There are considerations (workload at the top) and protocols (chain of command) that must be taken into account; decisions and plans are most easily implemented if the underlying logic and procedures are shared. Establishing career field web sites and direct e-mail groups to IM managers and using it to routinely inform the field on decisions and events that effect them would go a long way to foster organizational buy-in.

Another factor in continuity is common experience and training. This can only be achieved by CIO ownership of development and mentorship. This starts with visibility of each manager or manager-to-be from entry to release. The FTS IM community is small enough to allow individual tracking. The next step is CIO insistence on input with respect to assignments, within development parameters. CIO ownership of development is the only way to ensure people are not pigeon holed through by-name requests or missed in the development cycle. It is also the only way to ensure that there are individuals that have seen enough of the organization to be effective in developing a support infrastructure for the entire enterprise.

Many interviewees observed that the field was too short of time and money for training; they only did what was required. We will always be short of money and people, so training and "exposure rotations"[11] must be centrally mandated and centrally funded (waivers from CIO only). Utilization of approved local vendors and distance learning[12] for technology updates and courses for advancement is a viable option.

b. MILITARY DEVELOPMENT

1) STRUCTURE

The first issue impeding military development is the organizational structure. The grade structure of the IM community has crept up over time.

---

[11] "Exposure Rotations" are explained under Civilian Development, Training and Schools
[12] The recent Office of Strategic Initiative's collaboration with the ARRTC and Booz, Allen, Hamilton for Information Operations 101 was highly successful.

Understanding that the Active Guard and Reserve program is now a career program, we need to restructure to promote growth over that career. We have a bubble at the O-4 level. Many of those positions started at O-3, but were advanced to benefit a good soldier and keep him/her in a unit past his/her promotion. The unit commander should always have significant input into their support structure, however, for the good of the organization, IM slot modification should require CIO concurrence.

The placement of military slots should also be reviewed with an eye to the bigger picture. If all of the slots at any level or inside any organization are limited to one type (Department of the Army Civilian [DAC], military, or contractor), the other classification of personnel will never fully understand the requirements of that organization. There must be a mixture of personnel types throughout the entire structure.

The CIO is, after all, ultimately responsible for the entire information support structure.[13] This restructuring would allow opportunities to develop fully rounded managers.

2) TRAINING AND SCHOOLS
As stated, essentially all military automators attend the SAC at FT Gordon. This provides an overview of the technical infrastructure part of the automation field. It does not provide much background in the resource management aspects of this field, especially those that are unique to the USAR FTS. Courses must be developed for specific skill sets required for each type of position. Soldiers headed for those positions must be required to complete those classes. Resident classes should be done TDY in route to the duty station to limit disruption once they are in place. To be effective, the skill set required for each position needs to be tracked and validated by feedback from the soldiers once they have been in place for a period of time. This could be done with on-line surveys, required annually. These would also

---

[12] The recent Office of Strategic Initiative's collaboration with the ARRTC and Booz, Allen, Hamilton for Information Operations 101 was highly successful.
[13] *Information Technology Management Reform Act*, 40 USC 1425. SEC. 5125. Agency Chief Information Officer

provide prospective candidates and assignment officers an idea of what the job entails.

The CIO needs to work with the ARRTC to leverage their existing training capability and courseware (the Information Manager's Course) and those capabilities currently being developed (distance learning). Other reasonable sources of training should also be found, tracked, and catalogued for the organization's use (e.g., Defense Acquisition University, US Agricultural University, and the Information Resources Management College [IRMC]).

At higher levels of the organization, we should ensure that we blend into the greater scope of Army, DoD, and governmental information management. Expanded attendance at courses like IRMC's Chief, Information Officer's certification or Chief, Information Assurance Officer's certification[14] is essential to our credibility outside of our organization.

There is still a place for locally acquired training in the USAR FTS structure. The USAR is too dispersed not to take this vehicle into consideration. There are industry standardized training programs that meet many of the USAR's needs.[15] However, the training should fit into the structure and architecture laid out by the CIO.

3) ROTATION

Assignments are an essential part of the development of a competent staff. The early assignment cycle should include infrastructure positions as well as direct automation support to other functional areas inside the organization. Exposure to the support required by other functional areas is essential to an effective upper level information manager. Without any idea of their requirements, how do you support them? The functional support positions must, however, be watched and controlled. They should not last more than 6-18 months. Any longer could limit the soldier's ability to maintain automation

---

[13] *Information Technology Management Reform Act*, 40 USC 1425. SEC. 5125. Agency Chief Information Officer
[14] Currently being developed at IRMC
[15] Annex E contains training recommended for specific positions provided by Mr. Richard Eckstein. Chief. Plans & Communications. Directorate of Information Management. FT Dix, NJ

expertise and opportunities to see other functional areas. These assignments should be interspersed with CIO positions to ensure the soldier's training is maintained and current CIO philosophy is understood.

This concept holds true for assignments across different levels of the organization as well. A soldier should not be limited to inside the "Triangle" (ARPERSCOM, USARC, OCAR). To appreciate the limitations and conditions imposed on the lower levels of command, experience is the best teacher. This, again, requires slots located at each level and functional area of the organization.

c. CIVILIAN DEVELOPMENT

1) STRUCTURE

The structure of the civilian positions in the Full Time Support of the USAR is problematic. Because GS-0301 is entitled *Miscellaneous Administration and Program Series[16]*, the development of the job description and the Knowledge, Skills, and Abilities (KSA) set is critical. There are many 301 series positions that have nothing to do with information management and the ones that do are, by definition, multi-disciplinary. The civilian personnel community has begun differentiating IM positions by referring to these as GS-301-I series[17].

==================================
GS-301

1. INTRODUCTION
a. Objectives. The objectives of this appendix are the following:

(1) This appendix defines the training requirements for the career development of individuals in the Information Management Specialist (301 - I) series positions from mid-level through executive level. It is designed to provide the in-depth multi-disciplined training needed by the information management specialist.

(2) In addition, this appendix may be used as a path for individuals who aspire to the 301 - I series. Specialty training identified in Appendices B through H may be used to complement the training identified for this track for individuals at or below grade 12.

---

[16] United States Office of Personnel Management, *Miscellaneous Administration and Program Series. GS 0301,* Workforce Compensation and Performance Service Classification Programs Division December 1997, HRCD-4
[17] *Army Civilian Training, Education, and Development System (ACTEDS) Plan for CP- 34* http://cpol.army.mil/train/acteds/CP_34/

Supervisory and individual responsibilities. Incumbents of IM tracks must be developed to assure successful transition from an IM technical specialist or other non-IM specialist to an information manager who is capable of integrating all of the IM functions. There are no "ready-made" IM managers. Individuals who aspire to information management positions must carefully plan and program IM course work and developmental assignments into their Individual Development Plans (IDP) over a period of several years. Supervisors and career program managers must devote significant effort in coaching, counseling, and mentoring individuals. They must ensure that training is broad-based in all the IM functions and not narrowly focused to specific job requirements.

This does not prevent the possibility of placing someone in an information management position with little or no background in this field. Although the classification facilitates filling these positions with local people, it enhances the possibility that the incumbent is in need of training. The lack of any real density of information management personnel at most locations magnifies the inability to grow managers from local personnel through previous On-the-Job (OJT) training and experience.

Given this situation, there needs to be established, enforced standards for job descriptions and KSA sets for Information Manager positions. There should be standard skill sets developed as prerequisites for IM positions. Adherence must be tracked, not by job title but by job function. However, **dictating standards without providing easily accessible ways of meeting those standards is just so much more bureaucratic interference.** The key is access to training and experience for current and prospective information managers. As stated in the Army Civilian Training, Education, and Development System (ACTEDS) Plan for career field 34, the primary responsibility remains with the employee[19], however the opportunities must be available.

Section II. Responsibilities (extract from ACTEDS CF-34 Plan. emphasis added by author)

> **9. SUPERVISORS**
> a. *Counsel individuals in the IM career program in all aspects of their career development.*
> b. *Work with each individual to prepare realistic, cogent, mission-oriented IDPs.*
> c. *Release employees selected for ACTEDS training and development opportunities.*
>
> **10. INDIVIDUALS**

[18] ibid. (highlights added by the author)

a. Actively participate with their supervisors and MCPM/ACPM in career planning.
b. Participate in the preparation of their own IDP.
c. Seek out and pursue training and developmental opportunities offered under ACTEDS.
d. Apply the competencies (knowledges, skills, and abilities (KSAs)) developed to enhance the effectiveness of the organization and to promote overall mission accomplishment.

=================================

Section VII. Self-Evaluation and Career Planning

This ACTEDS Plan serves as a valuable tool for planning and professional growth. Each individual is responsible for establishing their own career goals and objectives. The supervisor will encourage and advise the individual throughout the entire career developmental process and work with the employee to guide and recommend selection of the most advantageous on-the-job training, formal training courses, and self-developmental programs.

1. SUPERVISORS. Supervisors are responsible for providing coaching and counseling to their employees on their individual career development. This counseling includes assisting employees in establishing realistic career goals, assessing employees' shortfalls in training and experience, and identifying training and development. Supervisors should use DA Pam 690-43, (A Supervisor's Guide to Career Development and Counseling for Career Program Employees, 18 August 1989) as a guide and may request assistance from ACPMs in this endeavor.

2. INDIVIDUALS IN THE IM CAREER PROGRAM. For career development to work, each individual must assume primary responsibility for career planning and personal development and be actively involved to achieve results. Paramount to success is the establishment of individual career goals, ascertaining what training and development is needed to achieve those goals and then actively seeking out and pursuing the training and development required. In addition, individuals are strongly encouraged to obtain as much education (bachelor's/master's degrees) during their off-duty time as possible. This can be very beneficial to overall job performance.

=================================

2) TRAINING AND SCHOOLS

For the concept of dictated standards to work at all, the system, the command, and the leadership must provide readily available opportunities for training and experiential growth. These opportunities can take many forms: traditional schooling; distance learning and new technologies; or short term developmental rotations at headquarters. It is key that these opportunities are readily available and place limited additional burden on the commands. There currently are a number of sources of traditional schooling for information management. Larger participation of civilians at the US Army Computer Science School's SAC would be a start. Annex D includes a list of opportunities for traditional schools. The primary problem is that no item listed in Annex D address the specific needs of the USAR. For that reason, we must maintain a vehicle to cover those needs. The Army Reserve Readiness

16

Training Center's (ARRTC) Information Management Course could provide a USAR foundation. To be successful, the course material needs to be monitored and adjusted for current events by the USAR CIO. The CIO would also have to enforce participation by the USAR FTS Information Managers. Headquarters' patronage is critical.

Another consideration is the personnel depth problem. Courses should be found or devised that do not leave offices under or un-staffed for more than a couple of weeks at a time. There should be a central organization who takes responsibility for providing a list of viable training opportunities.

Because travel and training costs are and will continue to be a critical consideration, new approaches to training need to be explored and utilized. The ARTTC and Booz, Allen, and Hamilton, in conjunction with the OCAR Office of Strategic Initiatives, recently ran an Information Operations class simultaneously in seven locations across the continental US[19]. Modifications of this concept could be used to train information managers throughout the USAR.

A number of the observations stemmed from the lack of an understanding of the requirements from other levels of the organization and the fiscal decision process. This is best learned by being a part, even if only a transient part, of the other levels and processes. To produce managers fully versed in the underlying operation of the USAR, they have to see it. To accomplish that, there should be competitive "Exposure Rotations" at the major headquarters. These rotations should be structured so the participant is actually involved in the fiscal process and the decision process. These should not be loosely organized assistantships. Those, generally, end up used as free labor on extraneous projects. These rotations should include time inside the CIO organization and possibly time in other major functional areas, e.g., Program Analysis and Evaluation (PA&E) or Force Programs. This exposure

---

[19] These locations included USAR and ARNG locations at Burlington. VT: FT Sam Houston. TX: Camp Dodge, IA; FT Belvior, VA; Hanscom AFB, MA: Oklahoma City. OK: and Seattle. WA.

facilitates understanding of decisions made at that Headquarters while it also gives the Information Manager a greater ability to assist their Commander as well as the functionals at their command. This would also ensure that the decision makers take the field's requirements and challenges into account. These appointments should last six to twelve months. This is long enough to include the participant in a fiscal year cycle, but allows a number of people to participate.

The other benefit to this program is the exposure to the employee. The civilian workforce is becoming more mobile. The CIO should have a feeling for what talent lays inside the USAR for possible advancement inside the system.

3) ROTATION

Section VI. Mobility[20]

1. MOBILITY REQUIREMENTS. Only IM interns and individuals who are members of the Army Acquisition Corps are required to sign a mobility agreement.

2. GEOGRAPHIC MOBILITY. Most individuals will be able to achieve their career goals within a limited geographic area; however, individuals are encouraged to be mobile. Mobility can be a key factor in obtaining some competencies not available at all locations, particularly for individuals seeking the multi-specialty 301-I series, acquisition workforce/corps, senior graded (GS-14/15), and SES positions. Developmental assignments, for example, can require geographic mobility.

Although this is encouraged by the Civilian Personnel Office, I do not believe that rotation will be an effective way of growing civilian Information Managers in this program. That is why training and structure remain critical.

5. CONCLUSION

The USAR stands on the leading edge of a new era of warfare and technology. We can either pay the price to be prepared or pay the price for recovery and catch-up. Being prepared means ensuring our Information Managers are trained and capable. To accomplish that goal will take adjusting our structure, the rotation of our managers, our training courses, and our basic philosophy.

---

[20] *Army Civilian Training. Education. and Development System (ACTEDS) Plan for CP- 34*
http://cpol.army.mil/train/acteds/CP_34/

These challenges are not limited to the USAR. The Army, as a whole, and DoD are facing the same situation. The Department of Army solution and implementation of OPMS XXI may provide an extremely useful starting point for our effort.

Our structure must clearly identify those positions that require information skills. It must allow a career's worth of growth and progression. There have to be enforced prerequisites for Information Management positions. Our rotation patterns must facilitate exposure to all parts of the organization. These patterns must allow for periods of training for new skills and technology refresh in between assignments. Our training must be available to any interested personnel, using new techniques to reach larger audiences.

To accomplish these, there must be an involved central Information Management godfather: watching assignments - ensuring wide functional exposure; watching training - ensuring up to date, relevant material; watching people - growing the senior managers for the future.

ANNEX A

PERSONNEL INTERVIEWED

ORGANIZATION	NAME	MOS/GRADE	POSITION
Information Resource Management College, NDU	Ms. Donita McGeary		Associate Dean of Faculty and Academic Programs
USA Com Sci School School	COL Michael W. Lemons	O-6	Dir, USA Computer Science
USA Com Sci School	Mr. David Kintner	12xx/12	Instructional Systems Specialist
CIO, USAR (Atl)	COL James Kirkwood	53A/O-6	Associate CIO – Development
CIO, USAR (Atl)	LTC Kim Colton	53A/O-5	XO, Systems Integration
CIO, USAR (Atl)	MAJ Daniel Ingham	53A/O-4*	Dep Dir, ISSD – Network Services
CIO, USAR (DC)	MAJ John Myers	53A/O-4	Systems Analyst
CIO, USAR (DC)	Mr. Dale Becker	Contractor	
ISA - St Louis	COL C. Triplett	53C/O-6	Commander (A/C)
ISA - St Louis	LTC Joseph Burke	53C/O-5	Executive Officer
ISA - St Louis	Mr. Matt Philips	334/14	Chief, Info Sys & Data Man
ISA - St Louis	Mr. Lawrence Bosworth	334/14	Chief, Software Eng
ISA - St Louis	Mr. Charles Piggee	334/14	Chief, IM Operations Div
ISA - St Louis	Mr. Tom Stefek	334/13	Chief, Data Management
ISA - St Louis	MAJ Patsy Stewart	53A/O-4	Software Engineer
ISA - St Louis	Ms. Carol Gardner-Fox	1102/11	Contracting Agent
ISA - St Louis	Ms. Rhonda Maricle	334/09	Computer Assistant
ISA - St Louis	Mr. Michael Steger	334/11	Computer Specialist
US-ARPERSCOM	MAJ Stephen Dalzell	O-4	Personnel Proponency Office
81st RSC	Mr. Woody Waldrop	301/13	Information Management Officer
81st RSC	LTC Barry Montgomery	53A/O-5	Chief, Auto & Telecom Div
81st RSC	Mr. Russell Paige	Contractor	Chief, Network Support Div
81st RSC	Mr. D.H. Kirksey	301/11	Telecommunications Specialist
87th Trng Spt Div	MAJ John Defalco	53A/O-4	Information Systems Officer
87th Trng Spt Div (1st Bde)	MAJ Utnik	01A/O-4	Operations Officer (A/C)
FT Dix DOIM	Mr. Douglas R. Long	301/14	Director, Information Management
FT Dix DOIM	Mr. Richard S. Eckstein	391/13	Chief, Plans & Communications

ANNEX B

PROGRAM OF INSTRUCTION
SYSTEMS AUTOMATION COURSE

COURSE: 7E-53A   PHASE: VER: PRO
COURSE TITLE: SYSTEMS AUTOMATION
PEACETIME COURSE LENGTH: 019 WKS & 04 DAYS
MOBILIZATION COURSE LENGTH: 014 WKS & 04 DAYS
APPROVAL DATE: 1998/05/08
APPROVAL AUTHORITY: MICHAEL W. LEMONS, COL, SC,
                 DIRECTOR, COMPUTER SCIENCE SCHOOL
SUPERSESSION INFO: REPLACES POI DTD 10 SEP 92, APPROVED 10 DEC 92

PREFACE PAGE

PREPARATION DATE: 1998/05/08
COURSE: 7E-53A   PHASE: VER: PRO
COURSE TITLE: SYSTEMS AUTOMATION
TRAINING LOCATION: SIGNAL SCHOOL, FT GORDON, GA
SPECIALTY: 53A SYSTEMS AUTOMATION MANAGEMENT
SUPPORTING ITP: FA 53, SYSTEMS AUTOMATION, MAY 92

PURPOSE: To train personnel in the skills and knowledge needed to perform the duties of a systems automation management officer.

SCOPE: Subjects include life-cycle management of software and related hardware and telecommunications networks. Both tactical battlefield automated systems and strategic-sustaining base systems will be addressed.

PREREQUISITES: Active Army or Reserve Component officer personnel (2LT-LTC) and DA civilians GS-09 or above assigned to or on orders to positions requiring expertise in the life cycle management of systems ranging from microcomputers through mainframes or to positions where duties involve analysis, design, development or configuration management of computers and information systems. Attendees will have a Bachelor Degree with advanced computer training or experience.

SPECIAL INFORMATION: None
SECURITY CLEARANCE: NONE

DATA:	PEACETIME	MOBILIZATION
COURSE LENGTH:	019 WK 04 DAY	014 WK 04 DAY
ADJUSTED COURSE ICH:	1193.0	1191.0
CLASS SIZES: - MAXIMUM:	20	20
- OPTIMUM:	20	20
- MINIMUM:	12	12
ACADEMIC HOURS: - COURSE UNIQUE:	759.0	759.0
- SHARED:	0	
TOTAL:	759.0	
HOURS DEVELOPED BY OTHERS: - DEVELOPED:	0	
CONDUCTED:	0	

COURSE: 7E-53A   PHASE: VER: PRO
COURSE TYPE CODE: 03 OFFICER SPECIALTY/SSI
ITRO CODE: Q QUOTA COURSE/NON-ITRO
CONTRACT CODE: N NOT A CONTRACT COURSE
TRAINING START DATE: 1998/05/08
TD PROPONENT:
    DESIGN AND DEVELOPMENT: SIGNAL SCHOOL, FT GORDON, GA
    INSTRUCTOR PROVIDED
    SUPPORT: SIGNAL SCHOOL, FT GORDON, GA
ARMY COURSE PROPONENT: SIGNAL SCHOOL, FT GORDON, GA
TRAINING EVALUATION PROPONENT: SIGNAL SCHOOL, FT GORDON, GA

COURSE SUMMARY

COURSE: 7E-53A   PHASE: VER: PRO
PREPARATION DATE: 1998/05/08
COURSE TITLE: SYSTEMS AUTOMATION

ACADEMIC TIME	PEACETIME	MOBILIZATION
MODULE: A AUTOMATION FUNDAMENTALS	119.0	119.0
MODULE: B SOFTWARE ENGINEERING	336.0	336.0
MODULE: C NETWORKING	304.0	304.0
MANDATORY MODULE:	0.0	0.0
TOTAL:	759.0	759.0

ADMINISTRATIVE TIME		
ADMINISTRATIVE MODULE: AD	32.0	32.0
GRAND TOTAL:	791.0	791.0

ACADEMIC HOURS BY SECURITY CLASSIFICATION	PEACETIME	MOBILIZATION
UNCLASSIFIED:	759.0	759.0

TRAINING MODULE WITH TASK/COND/STANDARD(S)

COURSE: 7E-53A   PHASE: VER: PRO
PREPARATION DATE: 1998/05/08
COURSE TITLE: SYSTEMS AUTOMATION

TRAINING MODULE: A
TITLE: AUTOMATION FUNDAMENTALS

PURPOSE: To introduce the student to the Computer Science School and the Systems Automation Course, to determine the student's general knowledge level and basic skills, and to provide instruction and training in the subject areas of hardware, operating systems, information resource management, simulations, and information systems security.

TITLE: INPROCESSING
Terminal Learning Objective (TLO): During this block of instruction, the student will be briefed on the US Army Computer Science School, the Officer Training Division, and the Systems Automation Course. The student will be

given an e-mail account and taught how to access his/her account to send and receive e-mail messages. The student will also be familiarized with a web browser and accessing the Internet with a browser.

TITLE: HARDWARE
TLO: During this block of instruction, the student will be taught the basic hardware components of Intel-based PCs, the removal and installation of components, and troubleshooting. At the end of this block of instruction, the student will be able to: identify key features of PCs, identify minimum system requirements for Windows 95, install Windows 95, perform basic end user operations, perform basic disk maintenance using SCANDISK and DEFRAG, perform command line operations, and perform basic troubleshooting.

TITLE: OPERATING SYSTEMS
TLO: During this block of instruction, the student will be taught the basic principles and functionality of modern operating systems using Windows 95. Instruction will consist of an operating system overview, planning and installation, Windows 95 basics, customizing and configuring, plug and play, command line operations, and troubleshooting. At the end of this block of instruction, the student will be able to: identify key features of Windows 95, distinguish between situations requiring Windows 95 and Windows NT workstation, identify minimum system requirements for Windows 95, install Windows 95, perform basic end user operations, perform basic disk maintenance using SCANDISK and DEFRAG, customize Desktop and Start Menu, utilize all elements of the Control Panel, identify the components of Plug and Play (PnP), configure system using both PnP and legacy devices, perform command line operations, identify troubleshooting resources, and perform basic troubleshooting.

TITLE: INFORMATION RESOURCE MANAGEMENT
TLO: During this block of instruction, the student will be taught the basic principles and functionality of Information Resource Management, Information Mission Area, Life Cycle Management, Army ADP Professional Structure, Army Information Architecture, IMA Modernization Plan, and Battlefield Automated Systems. At the end of this block of instruction, the student will understand the elements of the Information Mission Area, IMA disciplines, and IMA operational environments. The student will know the regulations which govern IRM and will have web sites from which IRM and IMA information can be downloaded.

TITLE: SIMULATIONS
TLO: During this block of instruction, the student will be taught the uses of modeling and simulation in various environments to include current uses in the US Army and DOD; the basics of simulation to include queuing theory, various probability distributions, and their uses in generating events; components of simulation models; validity of simulation model results; generation of events; current US Army and DOD modeling and simulation projects; current agencies involved in modeling and simulation in the DOD, and the WARSIM 2000 project to include ORD, objectives, schedule of implementation, etc. At the end of this block of instruction, the student will be able to: list three primary types (categories) of simulation models, define the term "system" as it relates to what is simulated in models, describe why simulation models are used in various situations, list and define five components of a system, explain/discuss the pertinence of the "development of hypotheses" in simulation modeling, explain why models are useful and list three situations where models may be used in a military situation, explain the characteristics of two types of probability distributions, explain the term "event generation" as it pertains to simulation modeling, list five areas where simulation/modeling would benefit decision making in the military, and define the term "simulation model".

TITLE: INFORMATION SYSTEMS SECURITY
TLO: During this block of instruction, the student will be taught operational computer security functions which include the Army's ISS personnel structure, software security, hardware security, procedural security, data sensitivity classifications, computer laws, continuity of operations plan, risk management, virus analysis, and accreditation. At the end of this block of instruction, the student will be able to: explain the Army Information Systems Security Program Structure (AISSP); describe the four ISS personnel training levels; explain the classified data sensitivity levels; explain the unclassified data sensitivity levels and give examples of each; explain software security procedure precautions; explain the factors to consider when applying hardware security; describe password management procedures; list and explain the two types of training and awareness requirements; explain the procedures for completing destruction of classified electronic media; explain the access control; identify and

explain the four primary laws that affect computer security; explain the purpose of each Continuity of Operations Plan (COOP) subplan; explain the selection factors to be considered when choosing a potential COOP site; explain the terms "vulnerabilities". "threats". and "relative risks": explain the risk analysis formula I*F = ALE; explain the accreditation preparation process; and identify and explain the different kinds of "viruses" (boot virus, file virus, worm, trojan horse, macro viruses, multi-partite virus, polymorphic virus, and stealth virus).

TRAINING MODULE: B
TITLE: SOFTWARE ENGINEERING

PURPOSE: To provide instruction and training in the subject areas of IDEF (system and data modeling), database (using MS Access), programming (using Visual Basic), software engineering, and Web.

TITLE: IDEF (SYSTEM AND DATA MODELING)
TLO: During this block of instruction. the student will be taught the two IDEF disciplines. IDEF0 (IDEF zero) and IDEF1X (IDEF one X). IDEF0 will involve activity modeling and instruction on three ways to represent an activity model in graphical form. IDEF1X will involve database modeling and instruction on construction of relational databases and database normalization. At the end of this block of instruction. the student will know the meaning of the acronym IDEF and be able to: differentiate between IDEF0 and IDEF1X models. describe the significance of viewpoint in IDEF0 models. distinguish among the three IDEF0 graphical representations. use functional decomposition to evaluate an activity. separate data from information. describe the ANSI-SPARC 3 Schema Model. organize data using entities and attributes. identify instances of an entity. and link data using parent-child relationships.

TITLE: DATABASE (USING MS ACCESS)
TLO: During this block of instruction. the student will be taught the concepts, structure, and efficient utilization of relational data bases in a hands-on lab environment. At the end of this block of instruction. the student will be able to: explain the relational database concept and structure; design database tables with proper type of editing (input masking); utilize input validation rules and validation text back to entry person; explain the coding necessary to ensure a date being entered is less than the system date; explain and utilize arithmetic, comparison on and logical expressions in operator precedence; explain Boolean variable concepts; explain the purpose of utilizing "wild cards"; explain how to perform range value input validation checks; describe how to build relationships between tables; explain reasons for using queries; explain method of using queries to extract only certain fields from a table; describe the sort function. use of special arithmetic symbols and logical logical connectors; explain and demonstrate functions within the Expression Builder using conditional statements (IIF) and other built-in expressions; conduct queries using both the Query Wizard and the Design View; explain and demonstrate SQL coding; create Access forms using both the Form Wizard and the Design View; explain and demonstrate the ToolBox functions (combo box, command button, check box, list box, image, etc.); explain and demonstrate binding ToolBox functions to table fields (properties); create and demonstrate Access report creations utilizing support tools; and explain and demonstrate Access macros and modules.

TITLE: PROGRAMMING (USING VISUAL BASIC)
TLO: During this block of instruction. the student will be taught the basic concepts of programming, problem solving, programming logic. and the design techniques of an event-driven language. At the end of this block of instruction. the student will be able to: describe the process of visual program design and development; explain the term event-driven programming; list and describe the three steps for writing a Visual Basic project; describe the various files that make up a project; identify the elements in the Visual Basic environment; explain the differences among design time. run time. and break time; write. run save. print and modify a programming project; identify compile errors. run-time errors and logic errors; use text boxes. frames. check boxes. option buttons. shape. line and images effectively; set properties to objects; define access keys. set defaults and control the tab sequence and reset focus during program execution; code multiple statements from controls; distinguish between variables and controls. controls and data types; select the appropriate scope of declarations; accumulate sums and counts; format data for outputs; use decisions. conditions (if case), and logical statements (and. or. not); create menus and submenus for program control; perform data validation on objects; create projects with multiple forms; write sub-procedures and functions; use loop control structures; create and use list boxes and combo boxes; set up arrays;

create user-defined data types; create and use data files (sequential and random); access database files; change records, add new records, and delete records in a database table; and write code to perform advanced data handling and validation and to present error messages to user.

TITLE: SOFTWARE ENGINEERING
TLO: During this block of instruction, the student will be taught the fundamentals of the software development lifecycle including common lifecycle models. At the end of this block of instruction, the student will be able to: identify what the term "software engineering" means, recognize the seven phases of the software life cycle, describe life cycle models, relate life cycle models to their implementation of the seven phases of the software life cycle, understand the cost of wrong decisions, and understand the criticality of testing.

TITLE: SOFTWARE ENGINEERING PROJECT
TLO: The student will participate as a team member in a software engineering project where project management techniques will be applied. The team project will be completed and evaluated by the course manager prior to graduation.

TITLE: WEB
TLO: During this block of instruction, the student will be taught to develop and execute a dynamic web site. At the end of this block of instruction, the student will be able to: use Hper Text Markup Language (HTML) source code; create static, dynamic, and active web pages and integrate sound and graphics; develop a website containing active web pages that interact with databases and service database inquiries with a browser; integrate Active X controls and VB Script into a website; use VB Script to write script that processes information in the client browser before sending it to the server; and encrypt transactions.

TRAINING MODULE: C
TITLE: NETWORKING

PURPOSE: To provide instruction and training in the subject areas of networking essentials, NT core technology, internet working with TCP/IP, routers, Solaris systems administration, IP network management, network systems security, and MS Exchange/Defense Messaging System.

TITLE: NETWORKING ESSENTIALS
TLO: During this block of instruction, the student will be taught networking standards and terminology, planning, implementation, and troubleshooting. At the end of this block of instruction, the student will understand network terms, concepts, and standards. The student will be able to: plan a network to include media, topologies, protocols, and connectivity devices; implement a network to include managing a network, disaster recovery, network adapter cards, and NetBIOS names; and troubleshoot a network.

TITLE: NT CORE TECHNOLOGY
TLO: During this block of instruction, the student will be taught the "core" knowledge for supporting Microsoft Windows NT operating system version 4.0 and will be taught the skills necessary to install, configure, customize, optimize, network, integrate, and troubleshoot Windows NT 4.0. At the end of this block of instruction, the student will be able to: describe the system strategy for Windows NT 4.0; install Windows NT; configure the Windows NT environment; create and implement system policies; create and manage partitions, file systems, and fault-tolerant volumes; support running applications under Windows NT; identify network components and describe their function on a Windows NT-based computer; install and configure network transport protocols; install and configure network services on Windows NT server; implement remote access service (RAS); install and configure Microsoft Internet Information Server and Services for NetWare; install, configure, and support printers and printer resources; install client software; implement and troubleshoot directory replication and synchronization; recognize problems related to the boot process; and determine the appropriate action to take for common problems.

TITLE: INTERNETWORKING WITH TCP/IP

TLO: During this block of instruction. the student will be taught the fundamental concepts of managing a network consisting of Local Area Networks and interfaces to Wide Area Networks. utilizing high level network monitoring tools. utilizing server/network management tools. and applying network management concepts/techniques. At the end of this block of instruction, the student will be able to: list the four layers of the TCP/IP protocol suite and contrast them with the corresponding layer of the OSI-RM; define the term "connection-oriented" communications: list the major protocols and their interactions with the SNMP protocol: list the three primary classes of Internet addresses: define the terms "network ID" and "host ID" as they relate to Internet addresses and list the sizes of these items for the three primary classes of Internet addresses; list the basic components of a SNMP-based Network Management System: identify and specify the associated functions of major networking devices: install and configure a router on a network: define the need for a Domain Name System Server in networking: identify the major networking hardware devices and the purpose and function of each device in a network: monitor a "network management system" and print activity reports from stored Management Information Databases (MIB): interpret the outputs of a Network Management Station as it relates to devices and traffic; install and configure a Network Management Station (NMS): define the interaction between the TCP/IP protocol suite and SNMP in a network: describe the basic procedure for decoding frames captured on a network: specify the purpose of a MIB in network management: specify the relationship of MIB. SMI,

TITLE: ROUTERS

TLO: During this block of instruction. the student will be taught basic router capabilities. functions and operating system. At the end of this block of instruction. the student will be familiar with the user interface. router help, and router modes and will be able to configure Ethernet and high-speed synchronous serial ports and build host tables on the router.

TITLE: SOLARIS SYSTEMS ADMINISTRATION

TLO: During this block of instruction. the student will be taught the basic skills needed to interact with the UNIX Operating System and the basic skills necessary to administrator an Intel-based Solaris System. At the end of this block of instruction. the student will be able to: identify key features of the UNIX/Solaris Operating System: identify minimum system requirements for Solaris 2.5.1: install Solaris 2.5.1 on an Intel-based system: gain access to Solaris: log out of Solaris: interact with Solaris using the command line interface; navigate the File System; create. edit and delete files using VI Editor: interact with Solaris using the Open Windows Graphical User Interface: add and maintain user accounts. printers. and terminals using Admin Tool. maintain a secure Solaris system: communicate with users on the system and network: perform proper shutdown. booting. and rebooting procedures: schedule. monitor. and cancel processes: perform disk maintenance procedures: and identify the requirements for a certified Solaris Systems Administrator.

TITLE: IP NETWORK MANAGEMENT

TLO: During this block of instruction. the student will be taught the fundamental concepts of managing a network consisting of local area networks and interfaces to wide area networks. configuring router ports with SNMP. utilizing high level network monitoring tools. utilizing server/network management tools. utilizing network management tools. and applying network management concepts/techniques. At the end of this block of instruction. the student will be able to: list the three main areas of concern for network managers: list the five categories of management in the OSI Network Management Model: list the major protocols and their interactions with the SNMP protocol: list the three primary classes of Internet addresses: define the terms "network ID" and "host ID" as they relate to Internet addresses and list the sizes of these items for the three primary classes of Internet addresses: list the basic components of a SNMP-based Network Management System: identify and specify the associated functions of major networking devices: install and configure a router on a network: define the need for a Domain Name System server in networking: identify the major networking hardware devices and the purpose and function of each device in a network: monitor a Network Management System and print activity reports from stored Management Information Databases (MIB): interpret the outputs of a Network Management Station as it relates to devices and traffic: install and configure a Network Management Station (NMS): define the   interaction between the TCP/IP protocol suite and SNMP in a network: describe the basic procedure for decoding frames

captured on a network; specify the purpose of a MIB in network management; and specify the relationship of MIB, SMI, and SNMP in network management.

TITLE: NETWORK SYSTEMS SECURITY
TLO: During this block of instruction, the student will be taught a basic understanding of the threats and vulnerabilities to Army/DOD systems and networks and how to counteract those threats. At the end of this block of instruction, the student will be able to: describe the threats and vulnerabilities to Army/DOD AIS systems, describe the countermeasures and assisting activities available to assist administrators, and define and recognize common attack methodologies.

TITLE: NT ENTERPRISE
TLO: During this block of instruction, the student will be taught the Enterprise challenges that a large organization faces when implementing an NT network - single logon anywhere in the enterprise, centralized administration, and global access to resources. The student will learn how these challenges are met and the cost of meeting them. A number of NT services will be examined to determine what they do as well as their cost in network resources. Students will play the roles of Primary Domain Controller and Backup Domain Controller and study the synchronization process and its associated network traffic. The student will learn to use the Performance Monitor and to install and use Network Monitor. At the end of this block of instruction, the student will be able to: identify the Enterprise challenges and solutions; describe the important NT services and how they affect the workstation and network; understand trust relationships and the NT domain models; and understand the individual account, global group account, and local group account.

TITLE: MS EXCHANGE/DEFENSE MESSAGING SYSTEM .
TLO: N/A

ANNEX C

CIO KEY COMPETENCIES

KEY COMPETENCY SUBJECT AREA	AMP COURSES	INTENSIVE COURSES
1. Policy	**PRIMARY** Core courses **ENRICHMENT** Track: Critical Frameworks Underlying Public Policy (Previously Public Policy in the Information Age)	**PRIMARY** NWC: New World of the CIO **ENRICHMENT** IWO: Information Operations
2. Information Resources Strategic Planning	**PRIMARY** Core courses	**PRIMARY** IMP: Information Management Planning
3. Leadership / Management	**PRIMARY** Elective: Innovative Thinking for the Information Age OR Elective: Third Wave Organizations **ENRICHMENT** Elective: Overload: the Paradox of Information	**PRIMARY** LDC: Leadership for the 21st Century OR HRI: Strategic Human Resources Issues for IT Organizations

4. Process Improvement	PRIMARY	PRIMARY
	Core courses	LTO: Reengineering Organizational Processes
	ENRICHMENT	ENRICHMENT
	Track: Best Practices in Change Management (Previously Best Practices in Process Improvement)	MAS: Evaluating Strategic Alternatives with Modeling and Simulation
	Elective: System Dynamics: Dealing with Complexity Elective: Electronic Commerce	ECB: Electronic Commerce: Doing Business on the Information Highway
5. Capital Planning and Investment	PRIMARY	PRIMARY
	Elective: IT Capital Planning (Previously Managing Information Technology Investments)	MTI: IT Capital Planning (Previously Managing Information Technology Investments)
6. Performance and Results-Based Management	PRIMARY	PRIMARY
	Elective: Measuring Results of Organizational Performance	MOP: Measuring Results of Organizational Performance
	ENRICHMENT	ENRICHMENT
	Elective: Information Visualization	INV: Information Visualization

7. Technology Assessment	**PRIMARY** Core courses **PLUS** Track: Emerging Information Technologies **ENRICHMENT** Elective: The Information Highway Elective: Applying Multimedia Technology Elective: Computer Modeling & Simulation Elective: Virtual Reality for Managers Elective: Telecommunications Technologies	**PRIMARY** CST: Critical Information System Technologies (Previously Emerging Information Technologies) **ENRICHMENT** IHW: The Information Highway IDS: Improving Organizational Performance with Intelligent Decision Systems WEB: Strategic Management of Web Sites TEL: Telecommunications Technologies
8. Architectures	**PRIMARY** Elective: Managing Information Architectures and Infrastructures	**PRIMARY** ARC: Managing Information Architectures and Infrastructures OR DMS: Data Management Strategies
9. Security	**PRIMARY** Elective: Managing Information Security in a Networked Environment	**PRIMARY** SEC: Managing Information Security in a Networked Environment **ENRICHMENT** AII: Assuring the Information Infrastructure SAT: Management Information Security - Advanced Topics

10. Acquisition	PRIMARY	PRIMARY
	Core courses	ITA: IT Acquisition for the CIO
	ENRICHMENT	ENRICHMENT
	Track 4: Information Systems Acquisition	CAR 805: Contemporary Approaches to Acquisition Reform
	Elective: Future Directions in Software Management	IRM 303: Advanced Information Systems Acquisition
		SAM 301: Advanced Software Acquisition Management
		APMC: Information Technology Elective Track

ANNEX D

TRAINING SOURCES

ABBR	TRAINING SOURCE	ADDRESS	TELEPHONE/ E-MAIL
ACCP	Army Correspondence Course Program	SEE AIPD	
AFCEA	Armed Forces Communications and Electronics Association	4400 Fair Lakes Court Fairfax, Virginia 22033-3899	1-703-631-6135 1-800-336-4583, ext. 6135 E-Mail: pdc@afcea.org
	Air Force Computer Training Center	333d Training Squadron Stennis Hall Keesler AFB. MS 39534	1-601-377-2653/0518/5099 DSN 597-2653/0518/2204
AFIT	Air Force Institute of Technology	Commander. AFIT/RR 2950 P Street, Bldg. 125. Room 1008 Wright Paterson AFB. OH 45433-7765	1-513-255-6231 DSN 785-6231 E-Mail: counselors@afit.af.mil
AFS/ USAFS	U. S. Army Finance School	Commandant ATTN: ATSG-FS. Bldg. 10000 Lee Road Fort Jackson. SC 29207-7045	DSN 734-8578
AFSC	Armed Forces Staff College	Commandant 7800 Hampton Blvd. Norfolk. VA 23511-1702	1-804-444-5129 DSN 564-5129
AIPD	Army Institute for Professional Development	(Army Correspondence Course Program (ACCP)) ATTN: ATIC-DLS (Student Services) Newport News. VA 23628-0001	1-757-878-3085/3866
ALA	American Library Association	American Library Association 50 East Huron Street Chicago, IL 60611	1-312-944-6780
ALMC	Army Logistic Management College	Commandant ATTN: ATSZ-AM Fort Lee. VA 23801-6041	1-804-765-4965 DSN 539-4965 http://almc.army.mil
AMSC	Army Management Staff College	Commandant ATTN: TAPC-PCA 5500 21st Street. Suite 1206 Fort Belvoir. VA 22060-5934	1-703-805-4767 DSN 655-4767 http://amsc.belvoir.arm il

ARMA	Association of Records Managers and Administrators	Association of Records Managers and Administrators International 4200 Somerset Drive, Suite 215 Prairie Village, KS 66208	1-913-341-3808 1-800-422-2762 E-mail: hq@arma.org
AT&T	American Telephone & Telegraph	AT&T Technical Education Center 2340 Dulles Corner Blvd. Reston, VA 20171	1-703-713-7755/7067
AWC/ USAWC	U. S. Army War College	Commandant Directorate of Academic Affairs (Box 452) Carlisle Barracks, PA 17013-5050	1-717-245-4161/3404 DSN 242-4161/3404
	Berkeley	1800 Diagonal Road, Suite 250 Alexandria, VA 22314	1-800-301-0110 1-703-548-9471
BI	Brookings Institution	The Center for Public Policy Education 1775 Massachusetts Avenue, NW Washington, DC 20036-2188	1-202-797-6172 E-mail: adesai@brook.edu
CAL	Center for Army Leadership	U. S. Army Command and General Staff College Civilian Leadership Training Division Fort Leavenworth, KS 66027-6935	1-913-758-3582 DSN 585-3582
CEL	Center for Executive Leadership	Federal Executive Institute 1301 Emmet Street Charlottesville, VA 22903-4899	1-804-980-6200 E-mail: cel@opm.gov
CW	Case Western Reserve University	Case Western Reserve University ATTN:, Director 10900 Euclid Avenue Cleveland, Ohio 44106	1-216-368-2000
CU	Catholic University of America	Catholic University of America School of Library and Info Science Washington, DC 20064	1-202-319-5085
DAU	Defense Acquisition University	Defense Acquisition University ATTN: Registrar 2001 N. Beauregard Street Suite 750 Alexandria, VA 22311-1772	1-703-325-1345 1-703-845-6772 E-mail: dau-univ@acq.osd.mil
DEOMI	Defense Equal Opportunity Management Institute	7400 O'Malley Road Patrick Air Force Base, FL 32925-5360	1-407-494-6976/5381
DGEF	Dynamic Graphics Educational Foundation	Dynamic Graphics Ed. Foundation 6000 N. Forest Park Drive P. O. Box 1901 Peoria, IL 61656	1-800-225-8800

DINFOS	Defense Information School	Commandant ATTN: DINFOS/CMT Bldg. 8361. Duff Road Fort George Mead. MD 20755-5626	1-301-677-2173 DSN 923-2173
DISA	Defense Information Systems Agency	Defense Information Systems Agency D113 701 South Court House Road Arlington, VA 22204-2199	
DODSI	Department of Defense Security Institute	DoD Security Institute 8000 Jefferson Davis Highway Building 33E Richmond. VA 23297-5091	1-804-279-4758/4892 DSN 695-4758/4892
DTIC	Defense Technical Information Center	Defense Technical Information Center 8725 John J. Kingman Rd. Suite 0944 Fort Belvoir. VA 22060-6218	1-800-225-3842 1-703-767-8224 Web: http://www.dtic.mil
DSMC	Defense Systems Management College	Defense Systems Management College 9820 Belvoir Road Fort Belvoir. VA 22060-5565	1-703-805-2227/2850/ 3666 DSN 655-2227/2850
FED-LINK	Federal Library and Information Center	Library of Congress (FEDLINK) 101 Independence Avenue SE Washington. DC 20540-5110	1-202-707-4848 FAX (202) 707-4873 E-mail: fliccfno@loc.gov
GPO	Government Printing Office Institute for Federal Printing and Publishing	U.S. Government Printing Office STOP-FP Washington. DC 20401-4302	1-202-512-1283
GSA	General Services Administration	Interagency Training Center P. O. Box 15608 Arlington. VA 22215-0608	1-703-603-3216 1-800-489-7824
GWU	George Washington University	Center for Computing and Information Management 801 22nd Street. NW. Room B106 Washington. DC 20052	1-202-994-6140
HU	Harvard University	Harvard Business School Soldiers Field Road Boston. MA 02163	1-617-495-6127 E-mail: admissions@hbs.edu
ICAF	Industrial College Of The Armed Forces	Commandant National Defense University Eisenhower Building (# 59) Fort Lesley J. McNair Washington. DC 20319-6000	1-202-685-4333
IRMC	Information Resources Management College	National Defense University Building (#62). ATTN: IRMC-O Fort Lesley J. McNair Washington. DC 20319-6000	1-202-685-6300 FAX: (202) 685-3974

MLA	Medical Library Association	Medical Library Association Suite 300 Six North Michigan Avenue Chicago, IL 60602-4805	1-312-419-9094 E-mail: info@mlahq.org
NARA	National Archives and Records Administration	NARA 8601 Adelphi Road College Park, MD 20740-6001 20408	1-301-713-7100 E-mail: records.management@ arch2.nara.gov
NCSA	National Computer Security Association	NCSA 1200 Walnut Bottom Road Carlisle, PA 17013-7635	1-717-258-1816 1-800-488-4595 E-mail: info@ncsa.com
	Negotiation Institute, Inc.	Negotiation Institute, Inc. 14 East 48th Street, 5th Floor New York, NY 10017	1-212-715-0176
NISC	National Independent Study Center	National Independent Study Center 12345 W. Alameda Pkwy, Room 301 Lakewood, CO 80228	1-303-5804 Web site: http://www.grad.usda.gov
NLI	National Leadership Institute	University of Maryland University College University Boulevard at Adelphi Road College Park, MD 20742-1668	1-301-985-7195 E-mail: nli@umuc.umd.edu
NSA	National Security Agency	National Security Agency ATTN: S313 9800 Savage Road Fort George Meade, MD 20755-6807	1-410-859-6417
NWC	National War College	National War College Building (#61), Fort Lesley J. McNair Washington, DC 20319-6000	1-202-685-4210/4312 Web: http://www.ndu.edu
OCLC	Online Computer Library Center, Inc.	Online Computer Library Center, Inc. 6565 Frantz Road Dublin, OH 43017-3395	1-614-764-6000 E-mail: oclc@oclc.org
OPM	Office of Personnel Management	Office of Personnel Management 1900 E Street, NW Washington, DC. 20300	1-202-606-1108
PPA	Professional Photographers of America	Professional Photographers of America 57 Forsyth, NW, Suite 1600 Atlanta, GA 30303	1-800-786-6277 1-404-522-8600 Web: http://www.ppa-world.org
PSU	Pennsylvania State University	Pennsylvania State University Dean Smeal College of Business Administration University Park, PA 16802	1-814-863-1947 Web: http://www.psu.edu

	Pentagon Library	Pentagon Library Director Room 1A518 Washington, DC 20310-6000	1-703-697-4301
RIT	Rochester Institute of Technology	Technical and Education Center of Graphic Arts and Imaging 66 Lomb Memorial Drive Rochester, NY 14623-5604	1-800-724-2536
SES	Senior Executive Service	Headquarters, Department of the Army Assistant Secretary of the Army Manpower and Reserve Affairs The Pentagon Arlington, VA 20310	1-703-697-2204
SIG- CEN	Army Signal Center	Commander Computer Science School ATTN: ATZH-SS Fort Gordon, GA 30905-5130	1-706-791-5397 DSN 780-5397
SLA	Special Libraries Association	Special Libraries Association 1700 Eighteenth Street, NW Washington, DC 20009-2514	1-202-234-4700 E-mail: sla@sla.org
SONY	Sony Training Services	Sony Training Services 3300 Zanker Road MD SJ2A6 San Jose, CA 95134	1-408-955-4231 E-mail: training@ mail.sel.sony.com
SU	Syracuse University School of Information Studies	Syracuse University School of Information Studies 4-206 Center for Science and Tech Syracuse, NY 13244-2340	1-315-443-2736/2911 E-mail: ist@syr.edu
UAH	University of Alabama, Huntsville	Associate Director Division of Continuing Education Science and Engineering Huntsville, AL 35899	1-205-890-6015
U of P	University of Pittsburgh	Department of Library and Info Sci School of Information Sciences 505 Information Sciences Building Pittsburgh, PA 15260	1-412-624-4710 E-mail: slislbry+@pitt.ed
	USDA Graduate School	United States Dept of Agriculture Business Office 600 Maryland Ave, SW, Room 122 Washington, DC 20024-2520	1-202-456-9876
	University of Virginia	Alderman Library Special Collections Department Charlottesville, VA 22903-2498	1-804-924-3025 E-mail: mssbks@virginia.edu

Winona International School of Professional Photography	Winona International School of Professional Photography 57 Forsyth Street N.W., Suite 1500 Atlanta, GA 30303	1-800-742-7468
University of Wisconsin	University of Wisconsin Independent Learning Room 104, Extension Building 432 N. Lake Street Madison, WI 53706-1498	1-800-442-6460 E-mail: ilearn@admin.uwex.edu Web: //www.uwex.edu/ilearn
WNRC Washington National Records Center	Washington National Records Center 4205 Suitland Road Washington, DC 20409-0002	1-301-457-7000 E-mail: center@suitland.nara.gov

General Services Administration
1000 by 2000 Certificate Program

Participating Universities	Location	Telephone Number
Air Force Institute of Technology	Wright Patterson AFB, OH	513-255-7777/6231
American University	Washington, DC	202-885-2500
California State University	Fullerton, CA	714-278-2611
Capitol College	Virginia	703-998-5503
	Maryland	301-953-3200
Carnegie Mellon	Pittsburgh, PA	412-268-6185
Catholic University	Washington, DC	202-319-5085
Information Resources Management College	Washington, DC	202-685-6300
Drexel University	Philadelphia, PA	215-895-2053
George Washington University	Crystal City Education Ctr	703-521-9722
	Virginia Campus	703-729-8330
John Hopkins University	Rockville and Laurel, MD	301-294-7070
Long Island University	Brookville, NY	516-299-2293
Marymount University	Arlington, VA	703-284-5901
National Technological University	Fort Collins, CO	970-495-6414
North Carolina Central University	Durham, NC	919-560-6485
Northeastern University	Boston, MA	617-373-2462
Nova Southeastern University	Fort Lauderdale, FL	800-986-2247
Pace University	New York, NY	212-346-1689
	White Plains, NY	914-422-4191
Salva Regina University	Newport, RI	401-847-6650
Syracuse University	Washington, DC	202-234-1942
Temple University	Philadelphia, PA	215-204-7858
University of Dallas	Irving, TX	972-721-5174
University of Maryland	Baltimore County, MD	410-455-2335
University of Maryland,	College Park, Shady Grove,	301-985-7200

University College   Annapolis, and
National Institutes of
Health

Western International University   Fort Huachuca, AZ   520-459-5040

ANNEX E

FT Dix Training Plan

POSITION DESCRIPTION	POPULATION	LOCATION	TRAINING LOCATION	RESULT	MICROSOFT CERTIFICATION
LEVEL 3 NETWORK MANAGER (DOIM WORKER)	1 or 2 PER POST	DOIM	FORT GORDON GA	3YR LICENSE	Microsoft Certified System Engineer + Internet Microsoft Certified Systems Engineer Microsoft Certified Professional + Site Building Microsoft Certified Professional + Internet Microsoft Certified Professional UNIX Basic CISCO System Admin CISCO Advanced System Admin TCPIP
LEVEL 2 SYSTEMS ADMINISTRATOR (NETWORK OPNS CTR WORKERS)	5 TO 10	DOIM	FORT GORDON GA	3YR LICENSE	Microsoft Certified Database Administrator Microsoft Certified Professional + Site Building Microsoft Certified Professional + Internet Microsoft Certified Professional UNIX Basic UNIX System Admin UNIX Advanced System Admin NOVELL
LEVEL 1 SYSTEM ADMINISTRATOR (FUNCTIONAL PROPONENTS OF STOVEPIPES)	1 PER STOVEPIPE LESS THAN 25	FUNCTIONAL	FORT GORDON GA	3 YR LICENSE	Microsoft Certified Professional + Internet Microsoft Certified Professional UNIX Basic NOVELL
DOIM NETWORKING PERSONNEL	10	DOIM			Microsoft Certified Professional + Internet Microsoft Certified Professional UNIX Basic NOVELL
INFORMATION SYSTEMS SECURITY OFFICERS (ACTIVITY DESIGNATED)	1 OR MORE PER ACTIVITY LESS THAN 50	FUNCTIONAL	TOBYHANNA AD	CERTIFICATE	Microsoft Certified Professional
END USERS	100% OF POPULATION	N/A	CBT CD ON WORKSTATION	CERTIFICATE	

* Req Based upon Functional System Oper Systm

BIBLIOGRAPHY

Clinton, William J., *A National Security Strategy for a New Century*, The White House, October 1998

Office of the Inspector General, Department of Defense, *Report Number 97-019: Evaluation of the Reserve Component Automation System*, 1 November 1996.

RCAS Project Office, *Reserve Component Automation System: Acquisition Program Baseline Agreement*, 23 July 1996.

Information Resource Management College, National Defense University, *The Department of Defense Chief Information Officer's Certificate Program*, December 1988
http://www.ndu.edu/irmc/

Army Reserve Readiness Training Center, *Information Managers Course: ATRRS Number: 921-610*, http://www.mccoy.army.mil/arrtc/

The Army Authorization Documentation System - Revised, US Army Reserve extract, 2 December 1998

Information Technology Management Reform Act, 40 USC 1425. SEC. 5125. Agency Chief Information Officer

United States Office of Personnel Management, *Miscellaneous Administration and Program Series, GS 0301*, Workforce Compensation and Performance Service Classification Programs Division December 1997, HRCD-4

Office of the Assistant Secretary of the Army, Manpower & Reserve Affairs, *Army Civilian Training, Education, and Development System (ACTEDS) Plan for CP- 34* , November 1997
http://cpol.army.mil/train/acteds/CP_34/